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## VETERINARY IMPLANTER WITH DISINFECTANT DISPENSER

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### Field of the Invention

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5       The present invention relates to a veterinary implanter  
6       with disinfectant dispenser, and, more particularly, to such  
7       an implanter with a disinfectant reservoir and pump with a  
8       spray head attached to a hypodermic needle such that  
9       selective operation of the pump moves disinfectant from the  
10      reservoir to the spray head and into a cannula within the  
11      needle.

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### Background of the Invention

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15       Currently, growth stimulants are used to enhance the  
16      body weight of animals which are raised for slaughtering,  
17      such as cattle, swine, turkeys, chickens, and the like. In  
18      the case of cattle and swine, approved growth hormones are  
19      administered as solid pellets which are injected by an  
20      implanter equipped with a hypodermic needle. The needle is  
21      used to make a small, non-coring puncture wound into the ear  
22      of an animal and small pellets of growth hormone are forced  
23      through the needle and left in the ear as the needle is  
24      removed from the ear. The ears are commonly discarded in

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1     slaughtering, such that no unabsorbed residues of such  
2     pellets will end up in food products intended for humans or  
3     domestic animals. The pellets are formulated for timed  
4     release and absorption of the active ingredients over an  
5     extended period of time.

6                 The pellets are normally implanted while an animal is  
7     confined in a chute. An ear is grasped in one hand, and an  
8     implanter device having a large hypodermic needle is used to  
9     puncture the hide to enable a pellet dose to be injected  
10    between the hide and the next layer of tissue in the ear.  
11    The implanting must be done carefully to insure that the  
12    pellets are properly placed and that no pellet remains in  
13    the puncture in the hide, which could result in an  
14    infection. At the same time, the procedure must be carried  
15    out quickly since the animals are not entirely cooperative  
16    and may shake their heads to free the held ear. Further  
17    complicating the matter is that other procedures may be  
18    occurring at the same time as the implanting operation while  
19    the animal is confined, such as ear tagging, branding,  
20    veterinary inspections or procedures, or the like, which may  
21    further excite the animal.

22                 In U.S. Patent No. 5,522,797 to the present inventor  
23    (hereinafter "the '797 patent"), and entitled Slide Action  
24    Veterinary Implanter, which patent is hereby incorporated by  
25    reference, an implanter employs a slide action mechanism to

1 retract an impeller, store an impeller driving force in a  
2 spring in cooperation with a latch mechanism, reset a  
3 trigger, and advance a pellet magazine, all by a single  
4 reciprocation of the slide mechanism. Operation of the  
5 trigger then forces the pellets from the pellet magazine  
6 through the needle and into the animal's ear.

7         With efficient implanters such as that taught in the  
8 '797 patent, typically a large number of cattle or swine are  
9 implanted in rapid sequence, with the same needle often used  
10 with as many as 100 or more animals. Furthermore, these  
11 injections often occur in or near feedlots or other  
12 locations with considerably less than ideal sanitary  
13 conditions. Since these implantations involve the  
14 deliberate making of a puncture wound in the animal's ear,  
15 bacteria are carried into each animal's ear in varying  
16 degrees. This can cause a bacterial infection in the  
17 receiving animal, and, depending upon several factors,  
18 sometimes a bacteria-induced abscess can occur in the wound  
19 area, which can result in a "walling-off" of the implant,  
20 thereby reducing the effectiveness of the implant and  
21 delaying or preventing the healing of the implant area.

22         It is clear then, that a need exists for a reliable,  
23 effective, inexpensive and convenient apparatus and method  
24 of disinfecting the needle of an implanter such as that  
25 taught in the '797 patent, as well as introducing a

1 disinfectant into the ear puncture wound forming the implant  
2 area of each receiving animal.

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## 4 Summary of the Invention

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The present invention is directed to a veterinary implanter with disinfectant dispenser. The disinfectant dispenser includes a reservoir for holding a quantity of liquid disinfectant, a pump attached to the reservoir, and a special needle holder spray tip with the implanter including a needle receiver with an internal conduit which has an inlet end connected to a tube leading from the disinfectant pump. An exit end of the conduit has an exit opening connected to the needle spray tip which is designed to spray disinfectant 360 degrees about the inlet end of a cannula of a hypodermic needle which is held in place against the spray tip by a threaded needle holder extension. The inventive disinfectant dispenser thus allows an operator of the implanter to selectively inject a quantity of disinfectant into the needle with each implant, with the disinfectant then being carried by the implanted pellets into the wound created by the needle. In a first embodiment, the reservoir is attached directly to a grip portion of the implanter housing, and, in a second embodiment, a removable pellet

1 magazine drum includes the reservoir and pump positioned  
2 within a spiral of pellet magazines.

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4                   **Objects and Advantages of the Invention**

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6                 The principal objects of the present invention include:  
7                 to provide an improved veterinary implanter with  
8                 disinfectant dispenser; to provide such a device of the type  
9                 including a large hypodermic needle which is used to  
10                puncture the skin or hide of an animal and through which a  
11                stack of pellets is moved by an elongated impeller member;  
12                to provide such a device which allows an operator to  
13                selectively introduce a liquid disinfectant into the needle;  
14                to provide such a device in which the disinfectant is  
15                sprayed 360 degrees about the inlet end of the needle  
16                cannula by a special spray tip; to provide such a device in  
17                which the disinfectant in the needle is then carried into  
18                the puncture wound by the stack of pellets which are loaded  
19                into the needle from a magazine chamber and forced through  
20                the needle and into the puncture wound; to provide such a  
21                disinfectant dispenser which can be attached to the  
22                implanter, or, alternatively, can be carried in a pellet  
23                magazine drum attached to a base of the implanter; and to  
24                provide such a device which is economical to manufacture,  
25                which is positive and efficient in operation, which is

1 effective to disinfect the implanter needle and the puncture  
2 wound, and which is particularly well adapted for its  
3 intended purpose.

4 Other objects and advantages of this invention will  
5 become apparent from the following description taken in  
6 conjunction with the accompanying drawings wherein are set  
7 forth, by way of illustration and example, certain  
8 embodiments of this invention.

9 The drawings constitute a part of this specification  
10 and include exemplary embodiments of the present invention  
11 and illustrate various objects and features thereof.  
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13 **Brief Description of the Drawings**  
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15 Fig. 1 is a perspective view of a veterinary implanter  
16 apparatus which includes a first embodiment of the present  
17 invention, shown with the implanting needle inserted into an  
18 animal's ear.

19 Fig. 2 is a second perspective view of a veterinary  
20 implanter apparatus, which implanter includes a second  
21 embodiment of the present invention with the disinfectant  
22 reservoir and pump contained within a pellet magazine drum  
23 which is snapped onto a lower end of the implanter grip  
24 housing.

1       Fig. 3 is a greatly enlarged, fragmentary, cross  
2   sectional exploded view, taken along line 3-3 of Fig. 1, and  
3   illustrating the internal details of a spray tip, needle  
4   holder with conduit and threaded needle extension usable  
5   with both embodiments of the invention.

6       Fig. 4 is a greatly enlarged cross sectional view of  
7   the area of Fig. 3 highlighted by a circle and labeled as  
8   "4", illustrating the spray tip in greater detail.

9       Fig. 5 is a greatly enlarged, fragmentary, cross  
10   sectional assembly view, also taken along line 3-3 of Fig.  
11   1, with the needle holder extension threaded onto the  
12   implanter to hold the hypodermic needle and spray tip  
13   thereon.

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15                   **Detailed Description of the Invention**

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17       As required, detailed embodiments of the present  
18   invention are disclosed herein; however, it is to be  
19   understood that the disclosed embodiments are merely  
20   exemplary of the invention, which may be embodied in various  
21   forms. Therefore, specific structural and functional  
22   details disclosed herein are not to be interpreted as  
23   limiting, but merely as a basis for the claims and as a  
24   representative basis for teaching one skilled in the art to

1 variously employ the present invention in virtually any  
2 appropriately detailed structure.

3 Referring to the drawings in more detail:

4 The reference numeral 1 generally designates a slide  
5 action veterinary implanter apparatus with integral  
6 disinfectant dispenser which embodies the present invention.  
7 The apparatus 1 is used to implant solid form drugs, such as  
8 pellets 2 (Fig. 2) from a pellet chamber 3 of a magazine  
9 strip 4 into an ear 5 of an animal 6 through a hypodermic  
10 needle 7.

11 The implanter apparatus 1 is illustrated and described  
12 in detail in the '797 patent, and generally includes a  
13 housing 11 having a grip portion 12 with a trigger assembly  
14 13 pivotally mounted therein. An impeller assembly 14 (Fig.  
15 5), including an impeller member 15, is slidably mounted  
16 within the housing 11 in alignment with the needle 7 and one  
17 of the chambers 3 of a loaded pellet magazine strip 4. The  
18 needle 7 is used to puncture through the skin or hide of a  
19 part of the animal's ear 5, and the trigger assembly 13 is  
20 pivoted into the grip portion 12 of the housing 11, causing  
21 impeller member 15 to be urged through the magazine chamber  
22 3, thereby forcing a stack of pellets 2 through a cannula 8  
23 of the needle 7 and into a portion of the ear 5.

24 The needle 7 is attached to the implanter 1 via a  
25 needle assembly, generally indicated at 21, which assembly

1        21 includes a needle holder extension 23 with female threads  
2        24. The needle holder extension 23 is generally cylindrical  
3        in shape and is formed by cylindrical walls 31 which  
4        terminate in a tapered end section 32. The needle holder  
5        extension 23 is adapted to mate with a needle receiver 33 in  
6        the implanter housing 11 with the receiver being equipped  
7        with mating male threads 34. The needle receiver 33  
8        includes an internal channel 35 which is sized to mate with  
9        the interior cylindrical cannula 8 of the needle 7 and at  
10       least one conduit 36 is integrally formed within the needle  
11       receiver 33 with the conduit 36 including an inlet end 41  
12       opening forward from a front wall 42 of the needle receiver  
13       33 such that the inlet end 41 is connectable with a flexible  
14       hose 43. The conduit 36 also has an exit outlet 44 which  
15       opens outward from the needle receiver 33 into a concentric  
16       channel 45 formed in a spray tip 51. The concentric channel  
17       45 opens into one or more disinfectant channels 52 which  
18       connect the concentric channel 45 with a needle matching  
19       bore 53 formed in the spray tip 51.

20              The hypodermic needle 7 includes a tapered penetrating  
21        tip 54 which communicates with the cannula 8, which cannula  
22        8 terminates in a entrance end <sup>56</sup> ~~54~~ which is sized to mate  
23        with the bore 53 in the spray tip 51. A perimeter O ring 55  
24        surround the exterior of the entrance end <sup>56</sup> ~~54~~ of the needle  
25        7.

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1           In order to attach the needle 7 to the implanter 1, the  
2 spray tip 51 is positioned over the needle receiver 33 such  
3 that the internal bore 53 in the spray tip 51 is aligned  
4 with the internal channel 35 of the needle receiver 33. The  
5 needle 7 is then placed onto the spray tip 51 such that the  
6 cannula 8 of the needle 7 is aligned with the bore 53 in the  
7 spray tip 51. Finally, the needle holder extension 23 is  
8 placed over the needle 7 and is threaded onto the needle  
9 receiver 33 to clamp the needle 7 and the spray tip 51 in  
10 place on the implanter 1 with the O ring 55 sealing the  
11 needle cannula 8 to the spray tip internal bore 53, as shown  
12 in Fig. 5.

13           Referring to Fig. 1, in a first embodiment of the  
14 invention, a disinfectant reservoir 61 is attached to the  
15 exterior of the implanter 1 via a holding strap 62. A tube  
16 63 extends upward from the reservoir 61 to a pump 64  
17 operable by a push button 65. The tube 43 extends from the  
18 pump 64 upward to the inlet end 41 (Fig. 3) of the conduit  
19 36. With each operation of the pump 64 accomplished by  
20 pushing the push button 65, a quantity of disinfectant is  
21 pumped from the reservoir 61 through the tube 63, the pump  
22 64 and the tube 71 to the inlet end 41 of the needle holder  
23 conduit 36. The disinfectant then moves through the conduit  
24 36 and into the concentric channel 45 in the spray tip 51  
25 and thence is atomized into a spray as it moves into the

1 spray tip 51 via the channels 52. The sprayed disinfectant  
2 thus enters and disinfects 360 degrees about the interior of  
3 the cannula 8 of the needle 7. If a quantity of  
4 disinfectant is sprayed immediately prior to use of the  
5 implanter 1, the disinfectant will be carried into the ear 5  
6 of the animal 6 by the pellet stack 2 as it moves through  
7 the needle 7.

8 Referring to Fig. 2, a second embodiment of the  
9 invention is illustrated. As described in the '797 patent,  
10 each magazine strip 4 of the implanter 1 has a capacity of  
11 twenty pellet doses stored in corresponding pellet chambers  
12 3 which are connected by intervening webs 72. The chambers  
13 3 are slightly conical in shape and are arranged in a side  
14 by side parallel relation. The chambers 3 may have internal  
15 formations (not shown) to retain the pellets 2 therein. A  
16 plurality of strips 4 can be connected in end to end  
17 relation to increase the implanting capacity before the  
18 implanter 1 requires reloading. A magazine drum 73 can be  
19 snapped onto a lower end 74 of the housing grip portion 12.  
20 A plurality of end to end connected strips 4 are rolled up  
21 into the drum 73 and are fed upwardly through the grip  
22 housing portion 8 therefrom. As the pellets 2 in an  
23 individual magazine strip 4 are exhausted, the empty strip 4  
24 can be detached from the remaining strips 4 in the implanter  
25 1 and discarded, as taught in the '797 patent.

1       With the present invention, the magazine drum 73 serves  
2       a dual purpose in that a disinfectant reservoir 75 is  
3       positioned in the approximate center of the drum 75 such  
4       that the pellet strips 4 are wound thereabout in a spiral  
5       configuration. A conventional pump (not shown) operated by  
6       a push button 81 is positioned within the reservoir 75 such  
7       that each operation of the push button 81 sends a quantity  
8       of disinfectant upward through an attached tube 82 and into  
9       the inlet end 41 of the needle holder conduit 36. The  
10      disinfectant is then carried from the conduit 36 and  
11      atomized as it enters the needle 7 as described earlier.

12       A typical quantity of liquid disinfectant pumped with  
13      each operation of the push buttons 65 or 81 can be, for  
14      example, .5 cc. With that quantity dispensed with each  
15      dosage of pellets 2, a 1 ounce reservoir 61 or 75 can  
16      provide about 100 sprays. These quantities are provided by  
17      way of example only, and should not be regarded as limiting  
18      in any sense.

19       It should be noted that the embodiments illustrated and  
20      described herein are exemplary only. For example, the  
21      reservoir 61 can include a push button sprayer integral  
22      therewith instead of separately mounted, as shown in the  
23      reservoir 75. Furthermore, the routing of the conduit 36 is  
24      simply one of several variations which can be used to  
25      accomplish the goal of delivering a quantity of disinfectant

1 to the spray tip 51. Furthermore, the entire disinfectant  
2 dispensing system could be positioned within the implanter  
3 housing 11, and disinfectant dispensing and spraying could  
4 be done automatically with each operation of the triggering  
5 assembly 13. The needle 7 and spray tip 51 could be formed  
6 as an integral piece to simplify assembly and prevent  
7 leakage where they meet.

8 It is thus to be understood that while certain forms of  
9 the present invention have been illustrated and described  
10 herein, it is not to be limited to the specific forms or  
11 arrangement of parts described and shown.